Abstract

This invention discloses compounds of lithium nickel cobalt metal oxide and the methods of their fabrication. The formula for said compounds of lithium nickel metal of oxide is $Li_aNi_{1-b-c}Co_bM_cO_2$ where $0.97 \leqq a \leqq 1.05$, $0.01 \leqq b \leqq 0.30$, $0 \leqq c \leqq 0.10$, and M is one or more or the following: manganese, aluminum, titanium, chromium, magnesium, calcium, vanadium, iron, and zirconium.

The method for the fabrication of said compounds of lithium nickel cobalt metal oxide includes: (a) fabricating a cobalt nickel hydroxy compound; (b) ballgrinding to evenly mix said cobalt nickel hydroxy compound; a lithium compound and compound of said metal M; (c) calcining said mixture in oxygen at between 600℃ and 720℃ for 1 hour to 10 hours; (d) calcining a second time in oxygen at between 750℃ and 900℃ for 8 hours to 10 hours; (e) cooling the twice calcined compound rapidly; (f) ballgrinding and then sifting the cooled compound to obtain said compound of lithium nickel cobalt metal oxide.

The fabrication method of this invention produces said compound containing a high percentage of secondary granules that are formed by the aggregation of crystalline granules. These granules are spherically or elliptically shaped with no halite magnetic domains resulting in a material that has excellent electrochemical properties. Using these materials in the positive electrodes of rechargeable batteries produce batteries with high capacity and good cycle characteristics.